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**UK CL (Edition O ) A6S**

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**ONLINE:WPI**

## (54) Pneumatically operable amusement apparatus

(57) A pneumatically operable amusement apparatus which is at least partly submergible in water is disclosed as comprising a body containing a wheel 22 engaged with a propeller 30, such that when the apparatus is pneumatically connected via air tube 20 to an air source, the wheel is moved by air from the air source, such that the propeller is caused to rotate, and thereby to move the apparatus substantially horizontally. A pneumatically operable amusement system is also disclosed as comprising a pneumatically operable amusement apparatus and an air source comprising an electrically operable air compressor. The air compressor may be used in conjunction with an aquarium tank. The air compressor (68) may also be contained within a housing in the form of an island, (70, Figure 3). The air may be released from the body via rotatable cap 40 and aperture 54, in the form of a stream of bubbles. The apparatus may include movable flipping means ( 62, Figure 2B).

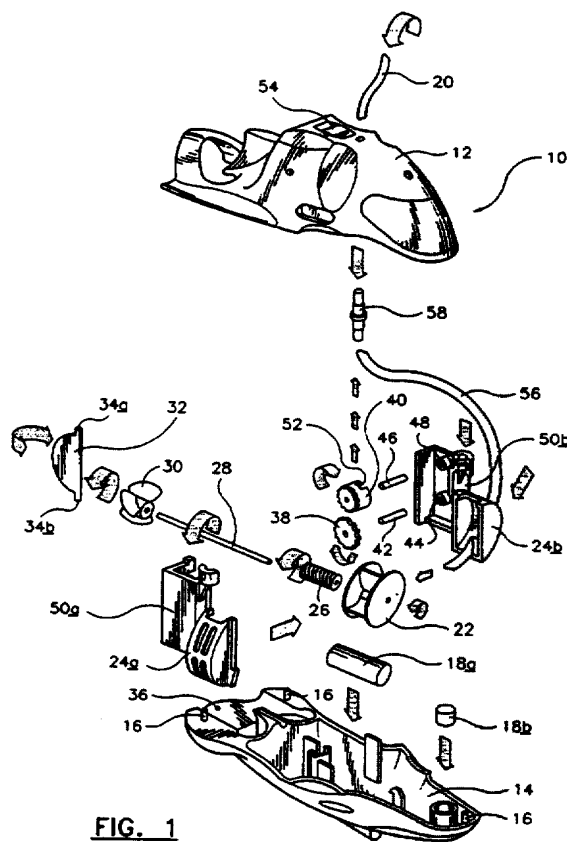
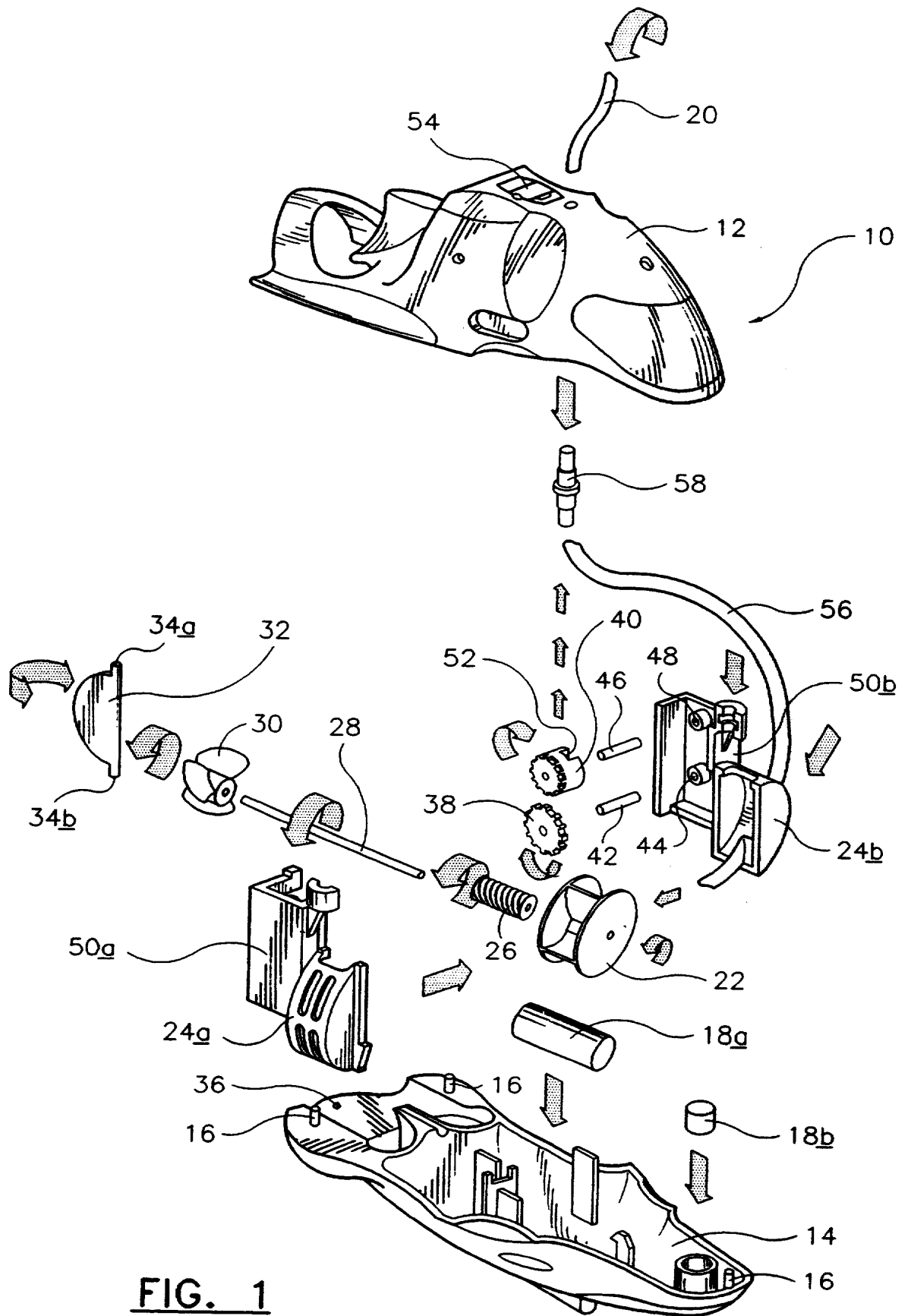


FIG. 1

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**FIG. 1**

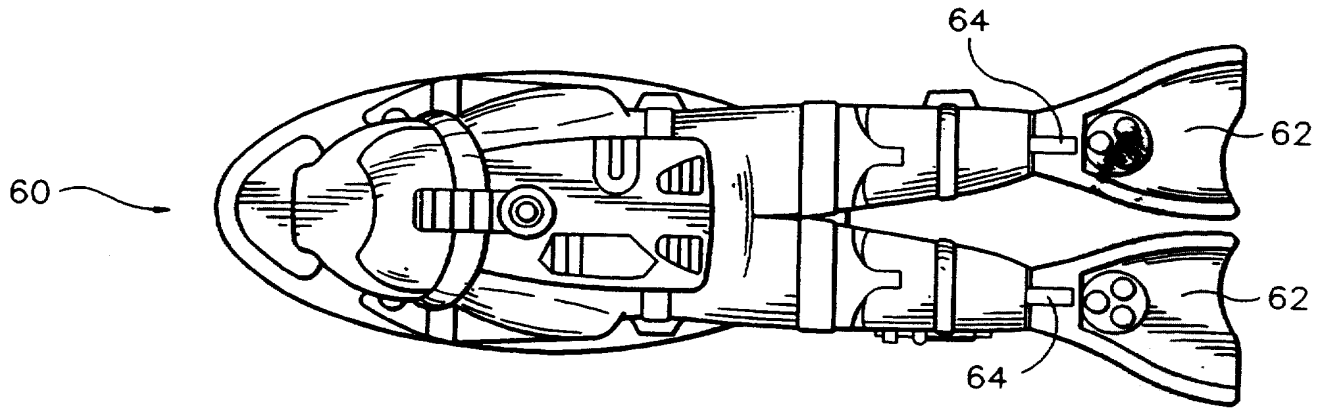


FIG. 2A

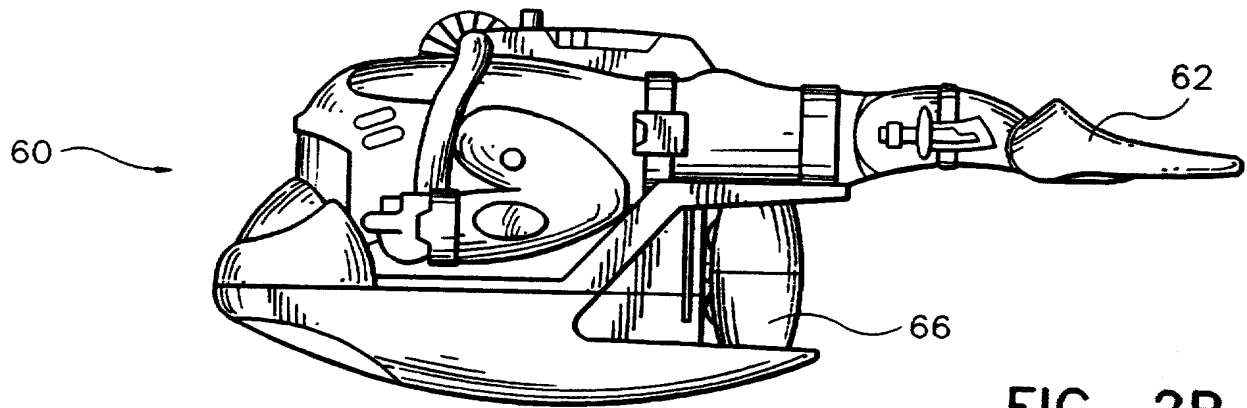


FIG. 2B

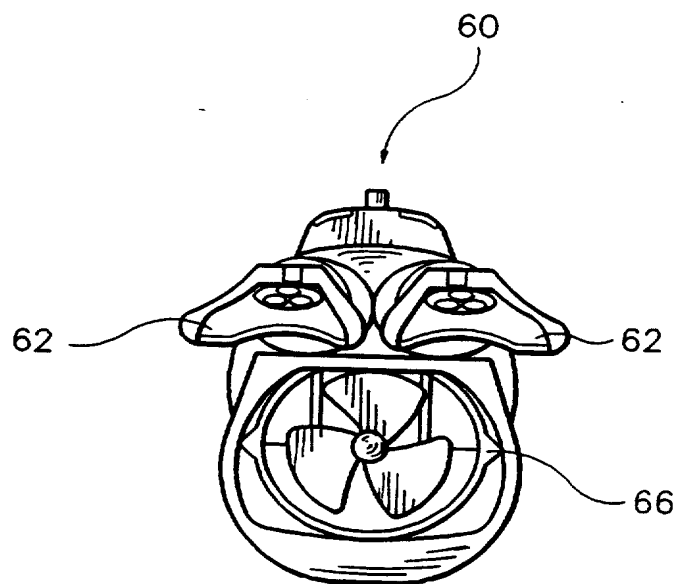
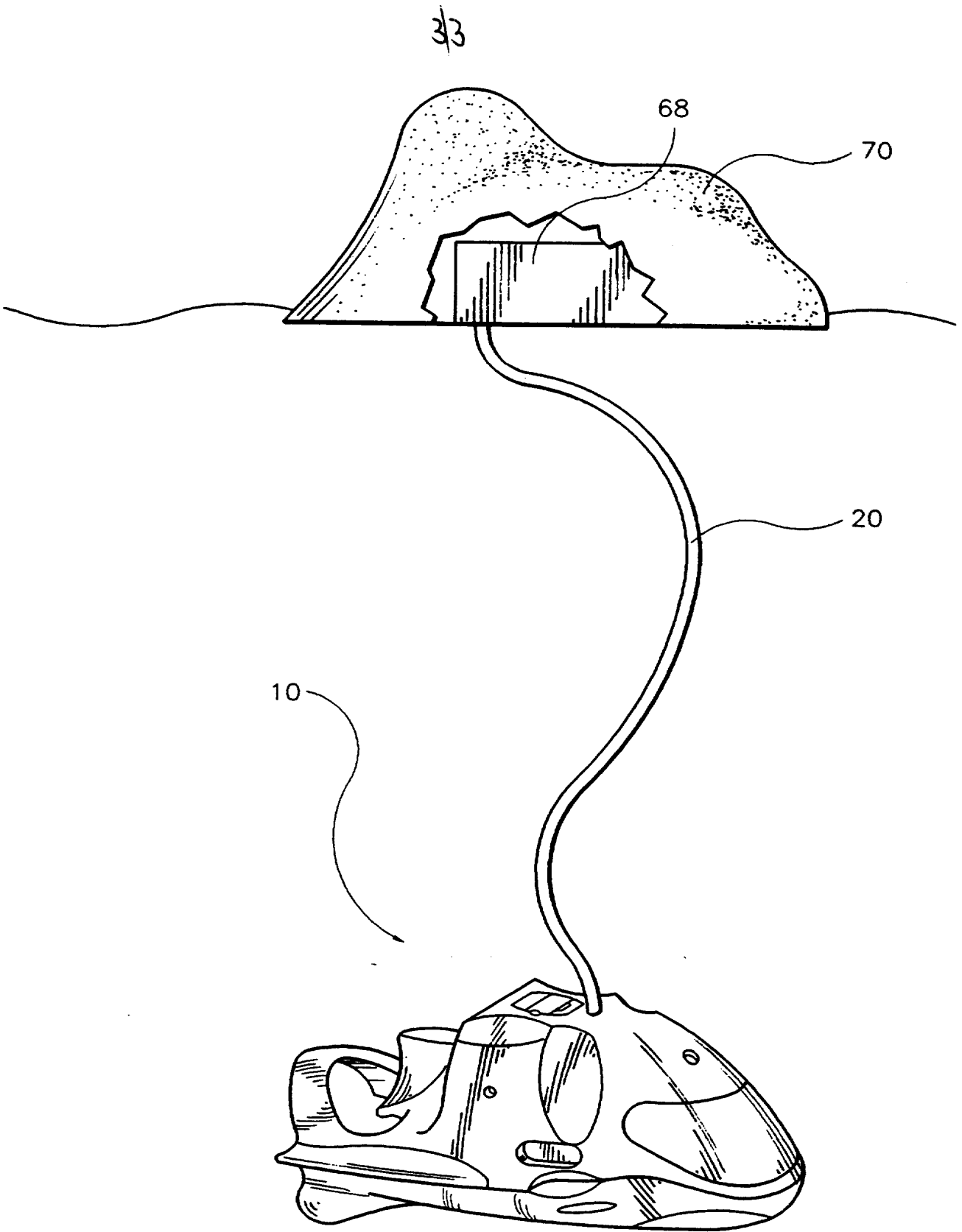


FIG. 2C



**FIG. 3**

A Pneumatically Operable Amusement Apparatus

This invention relates to a pneumatically operable amusement apparatus, and in particular such an apparatus usable in water.

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An existing pneumatically operable amusement apparatus takes the form of a miniature figure, e.g. a flying saucer, connected via a hose to an air source. Air may be supplied to the figure or withdrawn therefrom, in order to alter the density of the figure relative to the water outside, so that the figure may be caused to float or sink in the water. A shortcoming of such an apparatus is that it can only move upward and/or downward in water.

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It is therefore an object of the present invention to provide a pneumatically operable amusement apparatus, and a pneumatically operable amusement system, wherein the aforesaid shortcoming is mitigated, or at least to provide the public with a useful alternative.

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According to a first aspect of the present invention, there is provided a pneumatically operable and at least partly water-submergible amusement apparatus comprising a body member and a driving means, wherein when the apparatus is pneumatically connected to an air source, the driving means is operable to move the apparatus.

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Advantageously, the apparatus may be movable substantially horizontally when at least partly submerged in water.

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Conveniently, the apparatus may be connectable to the air source through a conduit member.

Suitably, the driving means may comprise a wheel member and a propelling member engaged therewith, and wherein the wheel member is rotatably movable when acted upon by air from the air source, and thereby to cause the propelling member to rotate.

Air supplied by the air source to the apparatus may advantageously be released from the apparatus in the form of bubbles via a releasing means.

The releasing means may conveniently comprise an opening allowing passage of bubbles.

The releasing means may suitably be rotatably movable.

Advantageously, the releasing means may be rotatably movable about an axis which is substantially perpendicular to the axis about which the wheel member and propelling member rotate.

Conveniently, the body member may comprise an aperture from which bubbles released by the releasing means are allowed to pass to the outside environment.

Suitably, the apparatus may further comprise flipping means swivellably movable

about an axis during movement of the apparatus.

Said axis may advantageously be substantially horizontal and perpendicular to the longitudinal axis of the apparatus.

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The flipping means may conveniently be in the form of a pair of flippers.

Said axis may conveniently be substantially vertical.

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Said axis may suitably be substantially parallel to the longitudinal axis of the apparatus.

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According to a second aspect of the present invention, there is provided a pneumatically operable amusement system comprising an apparatus according to any of the preceding claims and an air source pneumatically connectable to the apparatus, wherein the air source comprises an electrically operable air compressor.

Advantageously, the air compressor may be usable in conjunction with an aquarium tank.

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Conveniently, the air compressor may be substantially wholly received within a housing member floatable at least partly above water.

Suitably, the housing member may be in the form of an island.

The invention will now be described, by way of example only, with reference to the accompanying drawings, wherein:-

Fig. 1 is an exploded view of a first embodiment of a pneumatically operable amusement apparatus according to the a first aspect of the present invention;

Figs. 2A to 2C show, respectively, the top view, side view and back view of a second embodiment of a pneumatically operable amusement apparatus according to the first aspect of the present invention; and

Fig. 3 shows a pneumatically operable amusement apparatus as shown in Fig. 1 connected to an air source, thus forming a pneumatically operable amusement system according to the second aspect of the present invention; and

Fig. 1 shows a pneumatically operable amusement apparatus, in the form of a water vehicle figure 10, according to the first aspect of the present invention. The vehicle 10 is made up of an upper half body 12 and a lower half body 14. The lower half body 14 is provided with three upwardly standing poles 16 for insertion into corresponding holes (not shown) in the upper half body 12, to ensure proper alignment of the two half bodies 12, 14. Weights 18a, 18b are received within the lower half body 14, so that the vehicle 10 is at least partly submergible in water.

Air from an outside source (not shown in Fig. 1) is provided to the cavity formed by the upper and lower half bodies 12, 14 via an air tube 20. The air is directed



towards a wheel 22 contained within two hemispherical half casings 24a, 24b, so that the wheel 22 rotates about its longitudinal axis. The wheel 22 is fixedly engaged with a worm 26, which is in turn fixedly engaged with a first end of a shaft 28. The second end of shaft 28 is fixedly engaged with a propeller 30, such that rotation of the wheel 22 will bring about a corresponding rotation of the propeller 30. A rudder 32 including two protrusions 34a, 34b receivable within recesses 36 at the rear end of the upper and lower half bodies 12, 14 is provided. The rudder 32 is thus hingedly engaged to the stern of the vehicle 10 and rotatable about a substantially vertical axis, so that the vehicle 10 may move in a circular manner.

The worm 26 is in mesh with a worm gear 38, which is in turn in mesh with a threaded portion of a cap 40. The worm gear 38 is rotatable about a pin 42, an end of which being received within a hole 44 of a substantially rectangular half chamber 50b. In like manner, the cap 40 is rotatable about a pin 46, an end of which being received within a hole 48 of the half casing 50b. The respective other end of the pins 42, 46 are received within corresponding holes (not shown) in a half chamber 50a. Rotation of the wheel 22 will therefore cause the worm gear 38 and cap 40 to rotate about their respective pin 42, 46.

Air supplied to the vehicle 10, after acting upon the wheel 22, is allowed to rise through the cavity formed by the joining of the half chambers 50a and 50b. The air is, however, only allowed to pass through cap 40 through an opening 52, such that the air will be released away from the vehicle 10 through an aperture 54 in the upper half body 12 in the form of a stream of bubbles.

For ease of connection, the vehicle 10 is provided with an internal air tube 56 connected to one end of a connecting duct 58. The other end of the connecting duct 58 is connectable to the air tube 20. The vehicle 10 may therefore be disconnected from the air tube 20 as a unit.

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As shown in Figs. 2A to 2C, the pneumatically operable amusement apparatus may be in the form of a figure diver driving an underwater vehicle, generally designated as 60. There are provided a pair of flippers 62 which are swivellable about joints 64. During movement of the apparatus 60 in water, the flippers 62 will exhibit swivelling action to more vividly mimic the action of a diver in water. An alternative type of rudder is shown and designated as 66. The rudder 66 is in the form of a ring, which is rotatable about a vertical axis, so as to adjust the course of movement of the apparatus 60.

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The amusement apparatus may alternatively assume the shape of a fish model, in which the tail fin is freely hinged to the body portion and swivellably movable during movement about a vertical axis. The amusement apparatus may further assume the shape of a bird model, in which case the wings are freely hinged to the body portion and each swivellably movable during movement about an axis which is parallel to the longitudinal axis of the apparatus.

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Turning to Fig. 3, a vehicle 10 is shown as connected via the air tube 20 to an air compressor 68 housed within a container 70 in the form of an island. The container 70 may be made of plastic material, such that the air compressor 68 and the container

70 may float on top of water while the vehicle 10 moves in water.

In addition, the vehicle 10 may be connected to an air compressor used in aquarium tanks. Such enhances the appearance of the tank, and the interest in viewing the animals within.

It should be noted that the above only describes an example whereby the present invention may be carried out, and that various modifications and/or alterations may be made thereto without departing from the spirit of the invention. In particular, the gearing system of the apparatus may be so arranged that two propellers are provided.

**CLAIMS:-**

1. A pneumatically operable and at least partly water-submergible amusement apparatus comprising a body member and a driving means, wherein when the apparatus is pneumatically connected to an air source, the driving means is operable to move the apparatus.
2. An apparatus according to Claim 1 wherein the apparatus is movable substantially horizontally when at least partly submerged in water.
3. An apparatus according to Claim 1 or 2 wherein the apparatus is connectable to the air source through a conduit member.
4. An apparatus according to any of the preceding claims wherein the driving means comprises a wheel member and a propelling member engaged therewith, and wherein the wheel member is rotatably movable when acted upon by air from the air source, and thereby to cause the propelling member to rotate.
5. An apparatus according to any of the preceding claims wherein air supplied by the air source to the apparatus is released from the apparatus in the form of bubbles via a releasing means.
6. An apparatus according to Claim 5 wherein the releasing means comprises an

opening allowing passage of bubbles.

7. An apparatus according to Claim 5 or 6 wherein the releasing means is rotatably movable.

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8. An apparatus according to Claim 7 wherein the releasing means is rotatably movable about an axis which is substantially perpendicular to the axis about which the wheel member and propelling member rotate.

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9. An apparatus according to Claim 5, 6, 7 or 8 wherein the body member comprises an aperture through which bubbles released by the releasing means are allowed to pass to the outside environment.

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10. An apparatus according to any of the preceding claims further comprising flipping means swivellably movable about an axis during movement of the apparatus.

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11. An apparatus according to Claim 10 wherein said axis is substantially horizontal and perpendicular to the longitudinal axis of the apparatus.
12. An apparatus according to Claim 10 or 11 wherein the flipping means is in the form of a pair of flippers.
13. An apparatus according to Claim 10 wherein said axis is substantially vertical.

14. An apparatus according to Claim 10 wherein said axis is substantially parallel to the longitudinal axis of the apparatus.
15. A pneumatically operable amusement system comprising an apparatus  
5 according to any of the preceding claims and an air source pneumatically connectable to the apparatus, wherein the air source comprises an electrically operable air compressor.
16. An amusement system as claimed in Claim 15 wherein the air compressor is  
10 usable in conjunction with an aquarium tank.
17. An amusement system as claimed in Claim 15 or 16 wherein the air compressor is substantially wholly received within a housing member floatable at least partly above water.
18. A pneumatically operable amusement system according to Claim 17 wherein  
15 the housing member is in the form of a model of an island.
19. A pneumatically operable amusement apparatus substantially as herein  
20 described and with reference to accompanying Fig 1 or Figs. 2A to 2C.
20. A pneumatically operable amusement system substantially as herein described and with reference to Fig. 3.

**Amendments to the claims have been filed as follows**

1. A pneumatically operable and at least partly water-submergible amusement apparatus comprising a body member, drive means and propelling means, wherein when the apparatus is pneumatically connected to an air source, air from the air source acts on said drive means to drive the propelling means to move the apparatus.
2. An apparatus according to Claim 1 wherein the apparatus is movable substantially horizontally when at least partly submerged in water.
3. An apparatus according to Claim 1 or 2 wherein the apparatus is connectable to the air source through a conduit member.
4. An apparatus according to any of the preceding claims wherein the drive means is fixedly engaged with the propelling means.
5. An apparatus according to any of the preceding claims wherein the propelling means comprises a propeller.
6. An apparatus according to any of the preceding claims wherein the drive means comprises at least one wheel member which is rotatably movable when acted upon by air from the air source.

7. An apparatus according to any of the preceding claims wherein air supplied by the air source to the apparatus is released from the apparatus in the form of bubbles via releasing means.
- 5 8. An apparatus according to Claim 7 wherein the releasing means comprises an opening allowing passage of bubbles.
9. An apparatus according to Claim 7 or 8 wherein the releasing means is rotatably movable.
- 10 10. An apparatus according to Claim 9 wherein the releasing means is rotatably movable about an axis which is substantially perpendicular to the axis about which the wheel member rotates.
- 15 11. An apparatus according to Claim 7, 8, 9 or 10 wherein the body member comprises an aperture through which bubbles released by the releasing means are allowed to pass to the outside environment.
- 20 12. An apparatus according to any of the preceding claims further comprising flipping means swivellably movable about an axis during movement of the apparatus.
13. An apparatus according to Claim 12 wherein said axis about which the flipping means is swivellably movable is substantially horizontal and



perpendicular to the longitudinal axis of the apparatus.

14. An apparatus according to Claim 12 or 13 wherein the flipping means is in the form of a pair of flippers.

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15. An apparatus according to Claim 12 wherein said axis about which the flipping means is swivellably movable is substantially vertical.

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16. An apparatus according to Claim 12 wherein said axis about which the flipping means is swivellably movable is substantially parallel to the longitudinal axis of the apparatus.

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17. A pneumatically operable amusement system comprising an apparatus according to any of the preceding claims and an air source pneumatically connectable to the apparatus, wherein the air source comprises an electrically operable air compressor.

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18. An amusement system as claimed in Claim 17 wherein the air compressor is usable in conjunction with an aquarium tank.
19. An amusement system as claimed in Claim 17 or 18 wherein the air compressor is substantially wholly received within a housing member floatable at least partly above water.

20. A pneumatically operable amusement system according to Claim 19 wherein the housing member is in the form of a model of an island.

5 21. A pneumatically operable amusement apparatus substantially as herein described and with reference to accompanying Fig 1 or Figs. 2A to 2C.

22. A pneumatically operable amusement system substantially as herein described and with reference to Fig. 3.



Application No: GB 9610610.9  
Claims searched: 1 - 20

Examiner: Roger Casling  
Date of search: 4 March 1997

**Patents Act 1977**  
**Search Report under Section 17**

**Databases searched:**

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.O): A6S

Int Cl (Ed.6): A63H

Other: Online :WPI

**Documents considered to be relevant:**

Category	Identity of document and relevant passage	Relevant to claims
X	GB 658070 (FLORY) see page 2 line 38 et seq	1 - 3 at least

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.